Claims

1. Process for preparing a carbon-coated, Li-containing olivine or NASICON powder, comprising the steps of
- preparing a water-based solution comprising, as solutes, one or more Li-containing olivine or NASICON precursor compounds and one or more carbon-bearing monomer compounds,
- precipitating the Li-containing olivine or NASICON precursor compounds and polymerising the monomer compounds in a single step
- heat treating the obtained precipitate in a neutral or reducing environment so as to form a Li-containing olivine or NASICON crystalline phase and decompose the polymer to carbon.

2. Process according to claim 1, whereby the crystalline phase is $Li_uM_v(XO_4)_w$ with u = 1, 2 or 3, v = 1 or 2, w = 1 or 3, M is $Ti_aV_bCr_cMn_dFe_eCo_fNi_gSc_hNb_i$ with a+b+c+d+e+f+g+h+i = 1 and X is $P_{x-1}S_x$ with $0 \leq x \leq 1$

3. Process according to claim 2, whereby the crystalline phase is $LiFePO_4$

4. Process according to claim 1, whereby the precipitation of Li-containing olivine or NASICON compounds and the polymerisation of the monomers is performed by evaporating water from the water-based solution

5. Process according to claim 4, whereby the carbon-bearing monomer compounds are a polyhydric alcohol and a polycarboxylic acid

6. Process according to claim 5, whereby the polyhydric alcohol is ethylene glycol and the polycarboxylic acid is citric acid

7. Process for the production of carbon-coated $LiFePO_4$ according to claim 5, whereby
- the water-based solution contains equimolar amounts of Li, Fe and phosphate,
- the evaporation of water from the solution is performed at a temperature between 60 and 100 °C,
- the heat-treatment is performed at a temperature between 600 and 800 °C, preferably between 650 and 750 °C

8. Process according to claim 7 whereby the water-based solution is prepared using LiH_2PO_4 and $Fe(NO_3)_3$.aq

9. A carbon-coated $LiFePO_4$ powder for use in Li insertion-type electrodes, which, when used as an active component in a cathode cycled between 2.0 and 4.5 V against a Li anode at a discharge rate of C / 5 at 25 °C, is characterised by a reversible electrode capacity expressed as a fraction of the theoretical capacity and a total carbon content of
at least 75 % capacity and less than 4 wt.% carbon, or,
at least 80 % capacity and less than 8 wt.% carbon.

10. Electrode mix containing carbon-coated $LiFePO_4$ according to claim 9

11. A battery containing an electrode mix according to claims 10